

What Is Claimed Is:

1. A polymer blend composition comprising, in admixture:

A) from about 1.0 to about 99.0% by weight of the composition of at least one cationic polymer composition produced by reacting in a free radical polymerization reaction a mixture comprising:

- 1) about 6.0 to about 28.0% by total weight of the mixture of a member selected from the group consisting of amine-containing ethylenically unsaturated monomers, ethylenically unsaturated monomers containing at least one quaternary ammonium group, N-hydroxymethyl acrylamide, N-hydroxymethyl methacrylamide, N-hydroxymethyl-substituted acrylamide, N-hydroxymethyl-substituted methacrylamide, and combinations thereof;
- 2) about 0.1 to about 40.0% by total weight of the mixture of a member selected from the group consisting of acrylic esters of alcohols containing from 1 to 22 carbon atoms, methacrylic esters of alcohols containing from 1 to 22 carbon atoms, styrene, substituted styrenes, acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl ethers, vinyl esters, N-vinyl amides, and combinations thereof;
- 3) about 3.0 to about 5.0% by total weight of the mixture of a member selected from the group consisting of cationic surfactants and combinations thereof;
- 4) up to about 3.0% by total weight of the mixture of a member selected from the group consisting of non-ionic surfactants and combinations thereof;
- 5) up to about 9.0% by total weight of the mixture of a member selected from the group consisting of ethylenically unsaturated monomers containing at least one hydroxyl group and combinations thereof;
- 6) up to about 4.0% by total weight of the mixture of at least one chain transfer agent;

composition having a solids content in the range of about 1.0% to about 50.0%.

and a pH in the range of about 3.5 to about 8.5; and

B) from about 1.0 to about 99.0% by total weight of the composition of at least one anionic polymer composition produced by reacting in a free radical polymerization reaction a mixture comprising:

5 1) about 20.0 to about 50.0% by total weight of the mixture of a member selected from the group consisting of vinylic monomers and combinations thereof;

2) up to about 20.0% by total weight of the mixture of a member selected from the group consisting of water-dispersible polymers having an acid number of no greater than 250 and a weight average molecular weight in the range of about 4,000 to about
10 20,000 and combinations thereof;

3) up to about 5.0% by total weight of the mixture of a member selected from the group consisting of epoxy monomers that contain at least two ethylene oxide groups, epoxy monomers that contain at least two epoxide groups, epoxy monomers that contain at least one ethylene oxide group and at least one epoxide group, and combinations
15 thereof;

4) up to about 5.0% by total weight of the mixture of a member selected from the group consisting of anionic surfactants, non-ionic surfactants, and combinations thereof;

5) up to about 4.0% by total weight of the mixture of a member selected from the group consisting of chain transfer agents and combinations thereof;

20 6) up to about 5.0% by total weight of the mixture of at least one organic solvent;

7) a catalytic amount of polymerization initiator; and

8) the balance of the mixture being water; to produce an anionic polymer composition having a solids content in the range of about 1.0% to about 50.0%, a pH in the range of about 3.5 to about 9.0, and an acid number of no greater than about 22; and

25 wherein said polymer blend composition has an acid number no greater than about 22.

2. The polymer blend composition of claim 1 which comprises, in admixture:

A) from about 10.0 to about 90.0% by weight of the composition of at least one cationic polymer composition produced reacting in a free radical polymerization reaction a mixture comprising:

- 1) about 10.0% to about 15.0% by total weight of the mixture of a member selected from the group consisting of amine-containing ethylenically unsaturated monomers, ethylenically unsaturated monomers containing at least one quaternary ammonium group, N-hydroxymethyl acrylamide, N-hydroxymethyl methacrylamide, N-hydroxymethyl-substituted acrylamide, N-hydroxymethyl-substituted methacrylamide, and combinations thereof;
- 2) about 5.0% to about 20.0% by total weight of the mixture of a member selected from the group consisting of acrylic esters of alcohols containing from 1 to 22 carbon atoms, methacrylic esters of alcohols containing from 1 to 22 carbon atoms, styrene, substituted styrenes, acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl ethers, vinyl esters, N-vinyl amides, and combinations thereof;
- 3) about 4.0% to about 5.0% by total weight of the mixture of a member selected from the group consisting of cationic surfactants and combinations thereof;
- 4) up to about 3.0% by total weight of the mixture of a member selected from the group consisting of non-ionic surfactants and combinations thereof;
- 5) up to about 9.0% by total weight of the mixture of a member selected from the group consisting of ethylenically unsaturated monomers containing at least one hydroxyl group and combinations thereof;
- 6) up to about 4.0% by total weight of the mixture of at least one chain transfer agent;
- 7) a catalytic amount of polymerization initiator; and

and a pH in the range of about 3.5 to about 8.5, and

B) from about 10.0% to about 90.0% by total weight of the composition of at least one anionic polymer composition produced by reacting in a free radical polymerization reaction a mixture comprising:

- 1) about 35.0% to about 50.0% by total weight of the mixture of a member selected from the group consisting of vinylic monomers and combinations thereof;
- 2) about 5.0% to about 10.0% by total weight of the mixture of a member selected from the group consisting of water-dispersible polymers having an acid number of no greater than 250 and a weight average molecular weight in the range of about 4,000 to about 20,000 and combinations thereof;
- 3) up to about 4.0% by total weight of the mixture of a member selected from the group consisting of epoxy monomers that contain at least two ethylene oxide groups, epoxy monomers that contain at least two epoxide groups, epoxy monomers that contain at least one ethylene oxide group and at least one epoxide group, and combinations thereof;
- 4) about 1.0% to about 3.0% by total weight of the mixture of a member selected from the group consisting of anionic surfactants, non-ionic surfactants, and combinations thereof;
- 5) up to about 4.0% by total weight of the mixture of a member selected from the group consisting of chain transfer agents and combinations thereof;
- 6) up to about 5.0% by total weight of the mixture of at least one organic solvent;
- 7) a catalytic amount of polymerization initiator; and
- 8) the balance of the mixture being water; to produce an anionic polymer composition having a solids content in the range of about 1.0% to about 50.0%, a pH in the range of about 3.5 to about 9.0, and an acid number of no greater than about 22; and

wherein said polymer blend composition has an acid number no greater than about 22.

3. The polymer blend composition of claim 1 wherein the amine-containing ethylenically unsaturated monomer is a member selected from the group consisting of dimethylaminoethyl acrylate, dimethylaminoethyl methacrylate, diethylaminoethyl methacrylate, t-butylaminoethyl methacrylate, dimethylaminopropyl methacrylamide, allylamine, 2-vinylpyridine, 4-vinylpyridine, and combinations thereof.

4. The polymer blend composition of claim 1 wherein the ethylenically unsaturated monomer containing at least one quaternary ammonium group is a member selected from the group consisting of hydroxyethyl acrylate, hydroxypropyl acrylate, hydroxybutyl acrylate, hydroxyethyl methacrylate, hydroxypropyl methacrylate, butanediol monovinyl ether, allyl alcohol, and combinations thereof.

5. The polymer blend composition of claim 1 wherein the cationic surfactant is a member selected from the group consisting of alkyltrimethylammonium salts wherein the alkyl group contains from 8 to 22 carbon atoms and the counterion of the salt is a member selected from the group consisting of chloride, bromide, methylsulfate, and ethylsulfate; alkylbenzyltrimethylammonium salts wherein the alkyl group contains from 8 to 22 carbon atoms and the counterion of the salt is a member selected from the group consisting of chloride, bromide, methylsulfate, and ethylsulfate; alkylpyridinium salts wherein the alkyl group contains from 8 to 22 carbon atoms and the counterion of the salt is a member selected from the group consisting of chloride, bromide, methylsulfate, and ethylsulfate; and combinations thereof.

6. The polymer blend composition of claim 1 wherein the nonionic surfactant in the mixture reacted to produce the cationic polymer composition is a member selected from the group consisting of ethoxylated alkylphenols, ethoxylated fatty alcohols, ethylene oxide-propylene oxide block copolymers, and combinations thereof.

7. The polymer blend composition of claim 1 wherein the ethylenically unsaturated monomer containing at least one hydroxyl group is a member selected from the group consisting of hydroxyethyl acrylate, hydroxypropyl acrylate, hydroxybutyl acrylate, hydroxyethyl methacrylate, hydroxypropyl methacrylate, butanediol monovinyl ether, allyl alcohol, and combinations thereof

8. The polymer blend composition of claim 1 wherein the chain transfer agent in the mixture reacted to produce the cationic polymer composition is a member selected from the group consisting of dodecyl mercaptan, 2-mercaptoethanol, alkyl mercaptopropionates, mercaptoacetic acid, mercaptopropionic acid, octyl mercaptan, and combinations thereof.

9. The polymer blend composition of claim 1 wherein the polymerization initiator in the mixture reacted to produce the cationic polymer composition comprises from about 0.1% to about 3.0% by total weight of the mixture reacted to produce the cationic polymer composition and is a member selected from the group consisting of thermal initiators, redox initiators, and combinations thereof.

10. The polymer blend composition of claim 9 wherein the thermal initiator is a member selected from the group consisting of hydrogen peroxide, t-butyl hydroperoxide, di-t-butyl peroxide, benzoyl peroxide, benzoyl hydroperoxide, 2,4-dichlorobenzoyl peroxide, t-butyl peracetate, azobisisobutyronitrile, isopropyl peroxy carbonate, and combinations thereof.

11. The polymer blend composition of claim 9 wherein the redox initiator is a member selected from the group consisting of cumene hydroperoxide-sodium metabisulfite, cumene hydroperoxide-iron (II) sulfate, and combinations thereof.

13. The polymer blend composition of claim 1 wherein the cationic polymer composition has a pH in the range of about 4.5 to about 8.0.

14. The polymer blend composition of claim 1 wherein the vinylic monomer is a member
5 selected from the group consisting of styrenic monomers, acrylic monomers, methacrylic monomers, ethylenic monomers, and combinations thereof.

15. The polymer blend composition of claim 14 wherein the vinylic monomer is a member selected from the group consisting of acrylic acid, methacrylic acid, methyl methacrylate, ethyl
10 methacrylate, n-propyl methacrylate, n-butyl methacrylate, isopropyl methacrylate, isobutyl methacrylate, n-amyl methacrylate, n-hexyl methacrylate, isoamyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, N,N-dimethylaminoethyl methacrylate, N,N-diethylaminoethyl methacrylate, t-butylaminoethyl methacrylate, 2-sulfoethyl methacrylate, trifluoroethyl methacrylate, glycidyl methacrylate, benzyl methacrylate, allyl methacrylate, 2-n-
15 butoxyethyl methacrylate, 2-chloroethyl methacrylate, sec-butyl-methacrylate, tert-butyl methacrylate, 2-ethylbutyl methacrylate, cinnamyl methacrylate, crotyl methacrylate, cyclohexyl methacrylate, cyclopentyl methacrylate, 2-ethoxyethyl methacrylate, furfuryl methacrylate, hexafluoroisopropyl methacrylate, methallyl methacrylate, 3-methoxybutyl methacrylate, 2-methoxybutyl methacrylate, 2-nitro-2 methylpropyl methacrylate, n-octylmethacrylate, 2-
20 ethylhexyl methacrylate, 2-phenoxyethyl methacrylate, 2-phenylethyl methacrylate, phenyl methacrylate, propargyl methacrylate, tetrahydrofurfuryl methacrylate, tetrahydropyranyl methacrylate, methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, n-decyl acrylate, 2-ethylhexal acrylate, salts of methacrylic acid, methacrylonitrile, methacrylamide, N-methylmethacrylamide, N-ethylmethacrylamide, N,N-diethylmethacrylamide,
25 N,N-dimethylmethacrylamide, N-phenyl-methacrylamide, methacrolein, salts of acrylic acid, acrylonitrile, acrylamide, methyl alpha-chloroacrylate, methyl 2-cyanoacrylate, N-

combinations thereof

16. The polymer blend composition of claim 1 wherein the water-dispersible polymer is a member selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic anhydride and combinations thereof.

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17. The polymer blend composition of claim 1 wherein the water-dispersible polymer has a weight average molecular weight in the range of about 5,000 to about 12,000.

18. The polymer blend composition of claim 1 wherein the water-dispersible polymer has an acid number in the range of about 180 to 250.

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19. The polymer blend composition of claim 1 wherein the epoxy monomer is a member selected from the group consisting of aliphatic epoxidized urethanes, aromatic epoxidized urethanes, glycidyl acrylate esters, esters, siloxanes, aliphatic hydrocarbons, cyclic hydrocarbons, and combinations thereof.

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20. The polymer blend composition of claim 1 wherein the anionic surfactant is a member selected from the group consisting of alkyl sulfates, ether sulfates, phosphate esters, sulfonates, and combinations thereof.

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21. The polymer blend composition of claim 1 wherein the nonionic surfactant in the mixture reacted to produce the anionic polymer composition is a member selected from the group consisting of ethoxylated alkylphenols, ethoxylated fatty alcohols, ethylene oxide/propylene oxide block copolymers, and combinations thereof.

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22. The polymer blend composition of claim 1 wherein the chain transfer agent in the mixture is a member selected from the group consisting of mercaptopropionic acid, octyl mercaptan, and combinations thereof.

23. The polymer blend composition of claim 1 wherein the polymerization initiator in the mixture reacted to produce the anionic polymer composition comprises from about 0.1% to about 3.0% by total weight of the mixture reacted to produce the anionic polymer composition and is a member selected from the group consisting of thermal initiators, redox initiators, and combinations thereof.

24. The polymer blend composition of claim 23 wherein the thermal initiator is a member selected from the group consisting of hydrogen peroxide, t-butyl hydroperoxide, di-t-butyl peroxide, benzoyl peroxide, benzoyl hydroperoxide, 2,4-dichlorobenzoyl peroxide, t-butyl peracetate, azobisisobutyronitrile, isopropyl peroxy carbonate, and combinations thereof.

25. The polymer blend composition of claim 23 wherein the redox initiator is a member selected from the group consisting of cumene hydroperoxide-sodium metabisulfite, cumene hydroperoxide-iron (II) sulfate, and combinations thereof.

26. The polymer blend composition of claim 1 wherein the anionic polymer composition has a solids content in the range of about 35.0% to about 50.0%.

27. The polymer blend composition of claim 1 wherein the anionic polymer composition has a pH in the range of about 8.0 to about 9.0.

28. The polymer blend composition of claim 1 wherein the anionic polymer composition has an acid number no greater than about 10.

29. The polymer blend composition of claim 1 wherein the anionic polymer composition has an acid number no greater than about 5.

no greater than about 10.

31. The polymer blend composition of claim 1 wherein said composition has an acid number no greater than about 5.

5 32. An ink jet receptive coating comprising the polymer blend composition of claim 1.

33. The ink jet receptive coating of claim 32 wherein the coating further comprises a pigment.

10 34. The ink jet receptive coating of claim 33 wherein the pigment is a member selected from the group consisting of silica, alumina, plastic pigments, calcium carbonate, kaolin clay, and combinations thereof.

15 35. An ink jet printable product comprising a substrate coated on at least one side with the coating of claim 32.

36. The ink jet printable product of claim 35 where the substrate is a member selected from the group consisting of paper, paperboard, wood, plastics, metal foil, textiles, and combinations thereof.

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37. A coating comprising the polymer blend composition of claim 1.

38. The coating of claim 37 wherein the coating further comprises a pigment.

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39. The coating of claim 38 wherein the pigment is a member selected from the group consisting of silica, alumina, plastic pigments, calcium carbonate, kaolin clay, organic based